AnaGate CAN USB

User Manual

Analytica GmbH

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AnaGate CAN USB: User Manual

Analytica GmbH
by J. Gossens

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Abstract

This manual describes the intefaces and modes of operation of a *AnaGate CAN USB*.

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Revision 1.0	01.10.2010	JGo	Initial version
Revision 1.1	05.10.2011	ASc	New option *Boot with operational mode* on web configuration side *CAN settings* (FW 1.3.16).
Revision 1.2	14.08.2013	ASc	Description of advanced unit settings on web configuration page *Advanced settings* (FW 1.3.19) and the informational *Status* page.
Revision 1.3	01.04.2014	ASc	Support of CANopen Conformance Test Tool of the CiA.

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Introduction

This document describes the features and objectives of the CAN-USB-Gateway *AnaGate CAN USB*.

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Chapter 1. Description

The *AnaGate CAN USB* connects a PC to a CAN bus via USB. It basically works as a CAN master with no own CAN identifier on the bus.

For this reason the *AnaGate CAN USB* provides a USB interface and a single electrically isolated CAN interface. On the PC side the *AnaGate CAN USB* identifies itself as a network card that allows TCP/IP based access to the connected CAN bus.

Controlling and configuration of an *AnaGate CAN USB* is made through TCP/IP. The application protocol itself is described in detail (see [TCP-2010]). Thus the access to the device can be programmed via native calls to the TCP/IP socket interface. This means that any communication partner with a LAN interface is able to communicate to the device. Accessing the device with the supplied application libraries for Windows and Linux is much comfortable. The libraries includes the entire range of device functions and can be used with conventional programming languages.

1.1. Features

- The *AnaGate CAN USB* can send and receive CAN messages via its CAN interface. This can be done using a PC that supports TCP sockets and USB.
- Variable CAN bus speed (10, 20, 50, 62.5, 100, 125, 250, 500, 800 or 1000 kbps).
- Software configurable bus termination for the CAN interface.
- The *AnaGate CAN USB* is powered directly via its USB port, no external supply is needed.
- Software interface implemented as virtual network adapter, easy access via TCP/IP.
- System is addressed using a proprietary network protocol.
- Static IP address configuration for the *AnaGate CAN USB*, the virtual PC network card is configured automatically via DHCP.
- Several simultaneous network connections (5x TCP) are supported on the CAN interface.

1.2. Specification

Technical aspect		Specfication
Measurements	Desktop casing	120mm x 58mm x 32mm
	Weight	approx. 125g
CAN bus	Baud rate	10, 20, 50, 62.5, 100, 125, 250, 500, 800 or 1000 kbps, software configuration
	CAN controller	1x Microchip MCP 2515
	CAN interface	1x ISO 11898-2, galvanic decoupled
	Interface	1x DB9 plug incl. CAN_H, CAN_L and GND
USB interface	Signaling rate	12 Mbps

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Technical aspect		Specfication
	TCP/IP	Static IP addresses, dynamic assignment (DHCP) to the PC
	Interface	USB connector type B
Voltage supply	Voltage	5V direct current via USB
	Power consumption	max. 500 mA
Ambient temperature	Storage	0 .. 85 °C
	In operation	0 .. 60 °C

Table 1.1. Technical data, AnaGate CAN USB

Note

Protect the *AnaGate CAN USB* from direct sunlight.

1.3. Scope of delivery

The *AnaGate CAN USB* is supplied with the following components:

- 1x AnaGate CAN USB
- 1x CD with manual, programming API for Windows/Linux and CANopen driver for CANFestival
- 1x USB 2.0 cable

1.4. Interfaces and plugs

1.4.1. AnaGate CAN USB - left view

Figure 1.1. Left view, AnaGate CAN USB

The left side of the *AnaGate CAN USB* features the following connectors and LEDs (from left to right):

USB Port — The *AnaGate CAN USB* is connected to the PC via this USB port. A cable with a type A USB plug at its one end and a type B USB plug at the other end needs to be used.

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Busy LED — This yellow LED lights up when the *AnaGate CAN USB* is processing incoming CAN messages.

Power LED — This green LED lights up when voltage is being supplied via the USB port.

Reset — The *AnaGate CAN USB* can be reset to the factory settings using this button (see Section 2.7, " Factory reset" for further details).

1.4.2. AnaGate CAN USB - right view

Figure 1.2. Right view, AnaGate CAN USB

The right side of the *AnaGate CAN USB* features the following connectors and LEDs (from left to right):

CAN port — 9 pin D-sub connector to connect the CAN bus (CiA recommondation DS 102).

The pin allocation of the plug can be inferred from the following table.

Pin	Description
3	GND
2	CAN_L
1,4-6,8,9	not connected
7	CAN_H

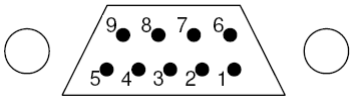

Table 1.2. Pin layout, CAN plug

Activity LED — This green LED lights up on activity on the CAN line.

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Chapter 2. Configuration

2.1. Initial installation

First the *AnaGate CAN USB* must be connected to the PC via USB.

If the PC shows a notification that no device driver could be installed then please proceed as follows:

2.1.1. Microsoft Windows XP

1. If you use Microsoft Windows XP then the **Found New Hardware Wizard** opens when you first connect the *AnaGate CAN USB* to your PC.

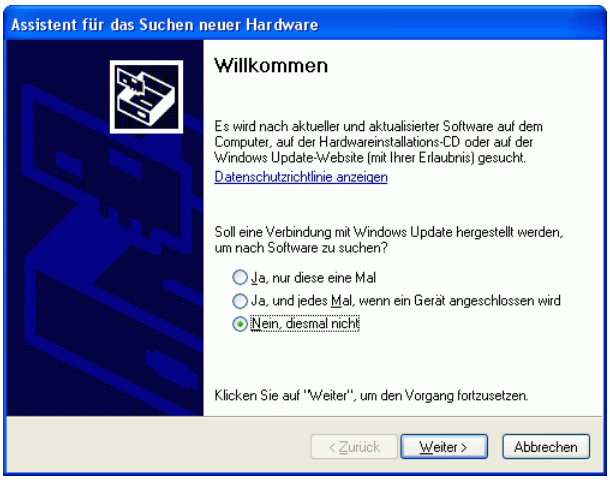
2. If the **Found New Hardware Wizard** doesn't start automatically then you can also launch it manually:

   a. Firstly, right-click the **My Computer** symbol, then click **Properties**.

   b. In the **System Properties** window switch to the **Hardware** tab and click the **Device manager** button.

   c. Right click the **RNDIS/Ethernet Gadget** entry that is marked with a yellow exclamation mark symbol and select Update Driver Software.

3. In the appearing wizard you first select **No, not this time** and then click **Next**.


Assistent für das Suchen neuer Hardware
Willkommen
Es wird nach aktueller und aktualisierter Software auf dem Computer, auf der Hardwareinstallations-CD oder auf der Windows Update-Website (mit Ihrer Erlaubnis) gesucht.
Datenschutzrichtlinie anzeigen
Soll eine Verbindung mit Windows Update hergestellt werden, um nach Software zu suchen?
Ja, nur diese eine Mal
Ja, und jedes Mal, wenn ein Gerät angeschlossen wird
Nein, diesmal nicht
Klicken Sie auf "Weiter", um den Vorgang fortzusetzen.
< Zurück
Weiter >
Abbrechen

4. Click **Install from a list or specific location (Advanced)**, and then click **Next**.

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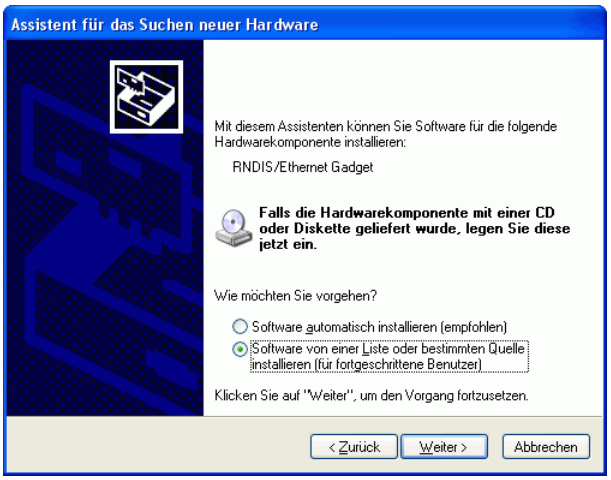
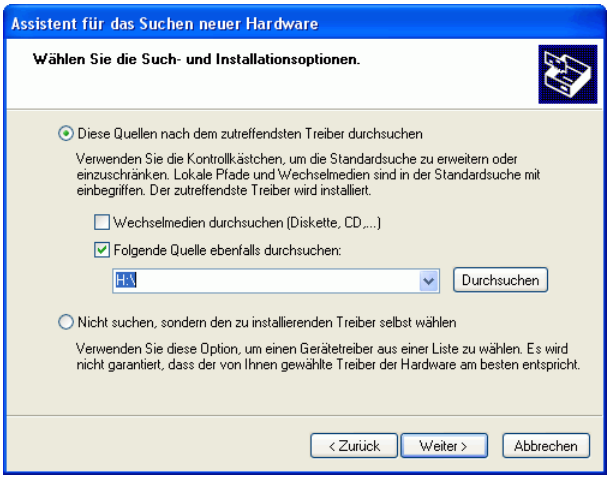

Assistent für das Suchen neuer Hardware
Mit diesem Assistenten können Sie Software für die folgende Hardwarekomponente installieren:
RNDIS/Ethernet Gadget
Falls die Hardwarekomponente mit einer CD oder Diskette geliefert wurde, legen Sie diese jetzt ein.
Wie möchten Sie vorgehen?
Software automatisch installieren (empfohlen)
Software von einer Liste oder bestimmten Quelle installieren (für fortgeschrittene Benutzer)
Klicken Sie auf "Weiter", um den Vorgang fortzusetzen.
< Zurück
Weiter >
Abbrechen

5. Click **Search for the best driver in these locations** and select the **Include this location in the search** checkbox. Insert the driver CD-ROM and select the driver file at **\drivers\AnaGateUSB\XP\linux.inf** on the CD-ROM by clicking the **Browse** button. Then click the **Next** button.


Assistent für das Suchen neuer Hardware
Wählen Sie die Such- und Installationsoptionen.
Diese Quellen nach dem zutreffendsten Treiber durchsuchen
Verwenden Sie die Kontrollkästchen, um die Standardsuche zu erweitern oder einzuschränken. Lokale Pfade und Wechselmedien sind in der Standardsuche mit einbegriffen. Der zutreffendste Treiber wird installiert.
Wechselmedien durchsuchen (Diskette, CD,...)
Folgende Quelle ebenfalls durchsuchen:
H:\
Durchsuchen
Nicht suchen, sondern den zu installierenden Treiber selbst wählen
Verwenden Sie diese Option, um einen Gerätetreiber aus einer Liste zu wählen. Es wird nicht garantiert, dass der von Ihnen gewählte Treiber der Hardware am besten entspricht.
< Zurück
Weiter >
Abbrechen

6. Confirm the Windows Logo warning with **Continue Anyway**.

Hardwareinstallation
Die Software, die für diese Hardware installiert wird:
Linux USB Ethernet/RNDIS Gadget
hat den Windows-Logo-Test nicht bestanden, der die Kompatibilität mit Windows XP überprüft. (Warum ist dieser Test wichtig?)
Das Fortsetzen der Installation dieser Software kann die korrekte Funktion des Systems direkt oder in Zukunft beeinträchtigen. Microsoft empfiehlt strengstens, die Installation jetzt abzubrechen und sich mit dem Hardwarehersteller für Software, die den Windows-Logo-Test bestanden hat, in Verbindung zu setzen.
Installation fortsetzen
Installation abbrechen

7. The driver software installation finishes after a short waiting time.

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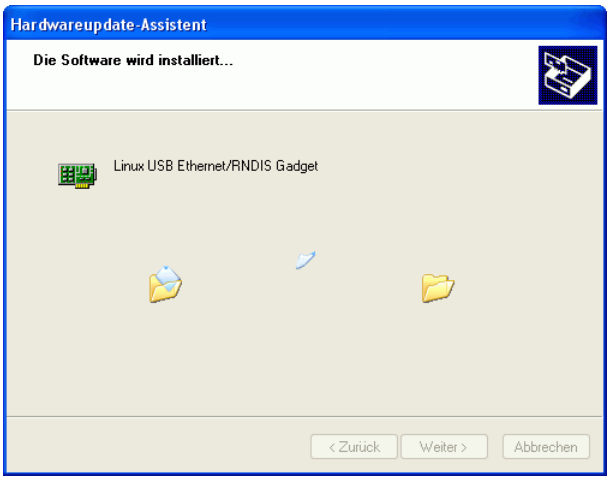

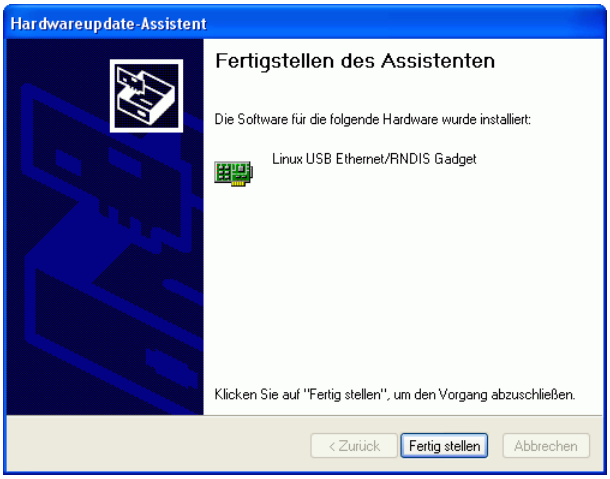

2.1.2. Microsoft Windows 7 und Windows 8/8.1

1. If you use Microsoft Windows 7 and Windows 8, then open the Control Panel via the Start menu.

2. Switch the display mode in the upper right corner to small symbols.

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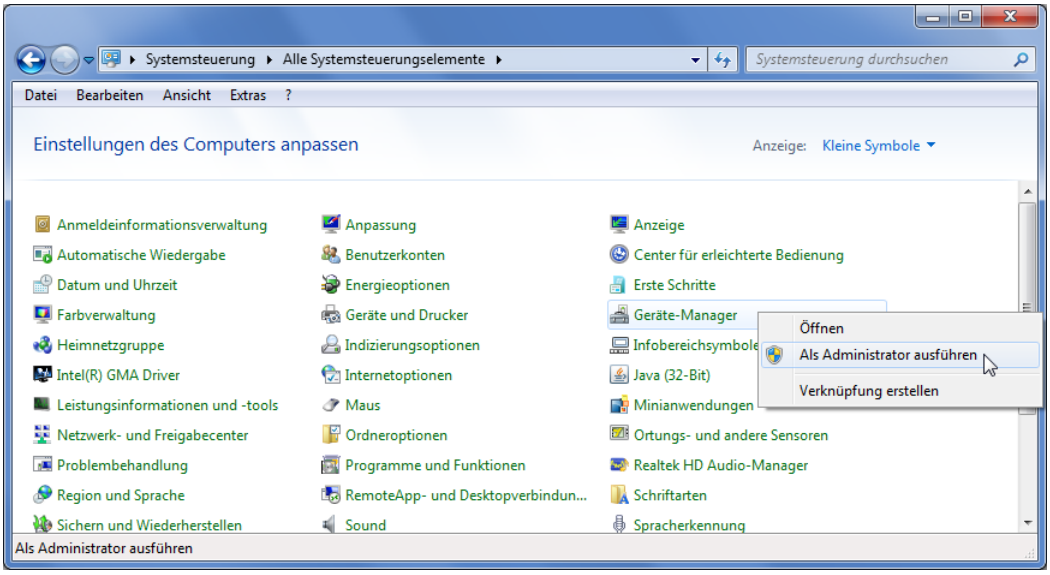
3. Right click the **Device Manager** and launch it with administrator priviledges. Enter your administrator password if prompted by the User Account Control.



4. Right click the entry **RNDIS/Ethernet Gadget** below **Other Devices** that is marked with a yellow exclamation mark symbol and select Update Driver Software.

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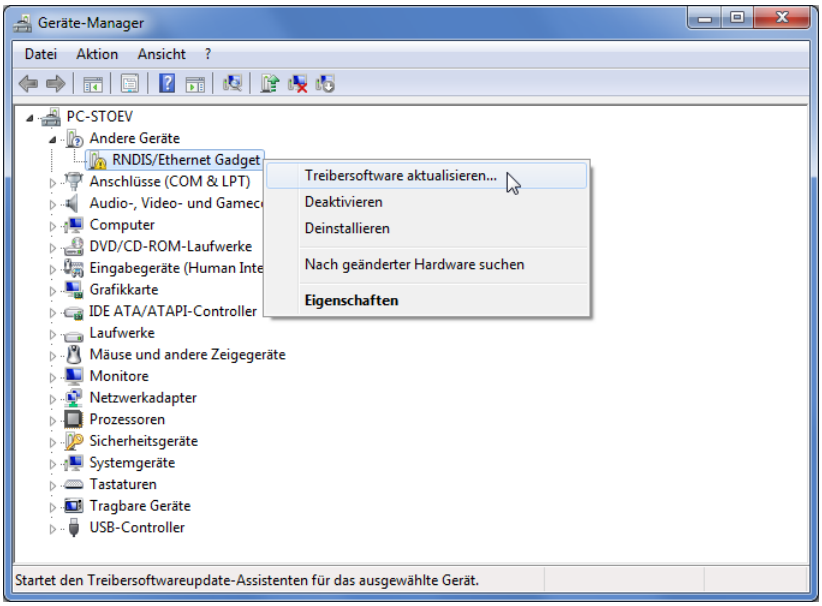
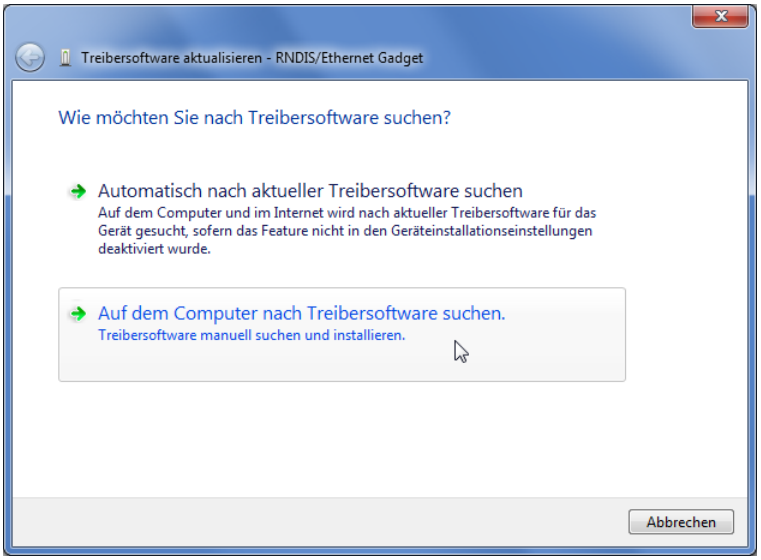


5. In the appearing assistant you first select **Browse my computer for driver software**.


Treibersoftware aktualisieren - RNDIS/Ethernet Gadget
Wie möchten Sie nach Treibersoftware suchen?
Automatisch nach aktueller Treibersoftware suchen
Auf dem Computer und im Internet wird nach aktueller Treibersoftware für das Gerät gesucht, sofern das Feature nicht in den Geräteinstallationseinstellungen deaktiviert wurde.
Auf dem Computer nach Treibersoftware suchen.
Treibersoftware manuell suchen und installieren.
Abbrechen

6. Then click **Let me pick from a list of device drivers on my computer**.

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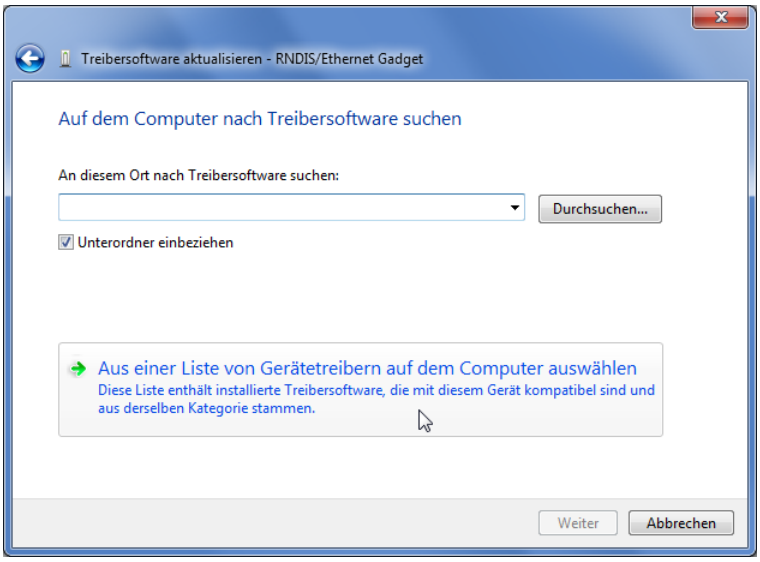
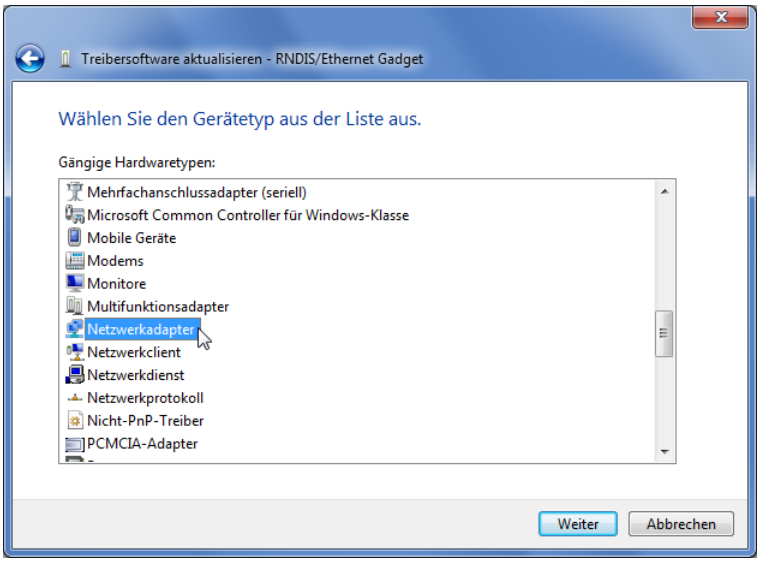

Treibersoftware aktualisieren - RNDIS/Ethernet Gadget
Auf dem Computer nach Treibersoftware suchen
An diesem Ort nach Treibersoftware suchen:
Durchsuchen...
Unterordner einbeziehen
Aus einer Liste von Gerätetreibern auf dem Computer auswählen
Diese Liste enthält installierte Treibersoftware, die mit diesem Gerät kompatibel sind und aus derselben Kategorie stammen.
Weiter
Abbrechen

7. In the list of device types, choose **Network adapters** and click the **Next** button.



8. Firstly select **Microsoft Corporation** in the manufacturer list on the left and then **Remote NDIS Compatible Device** on the right.

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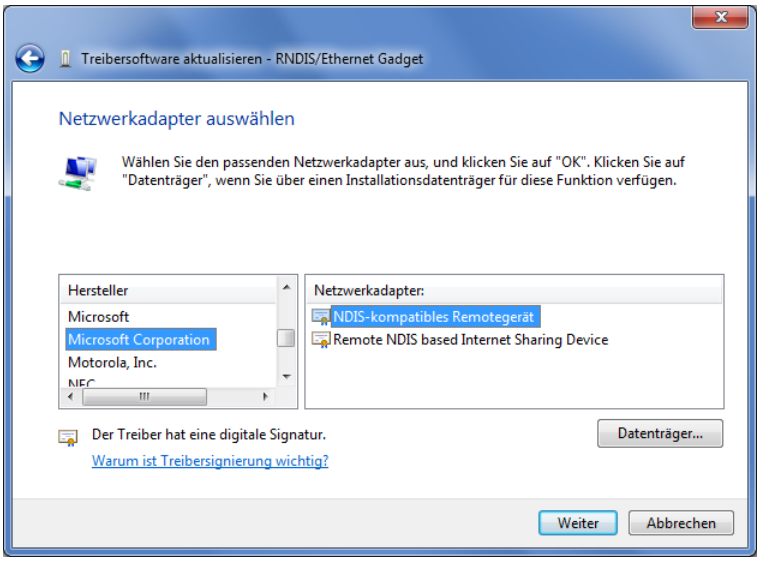
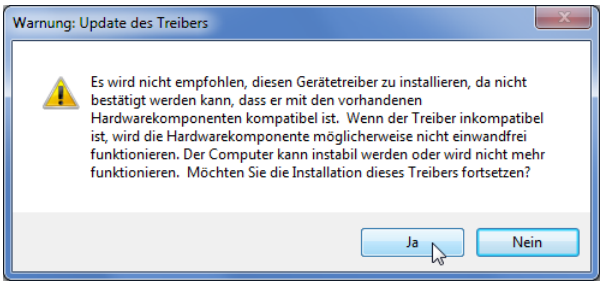
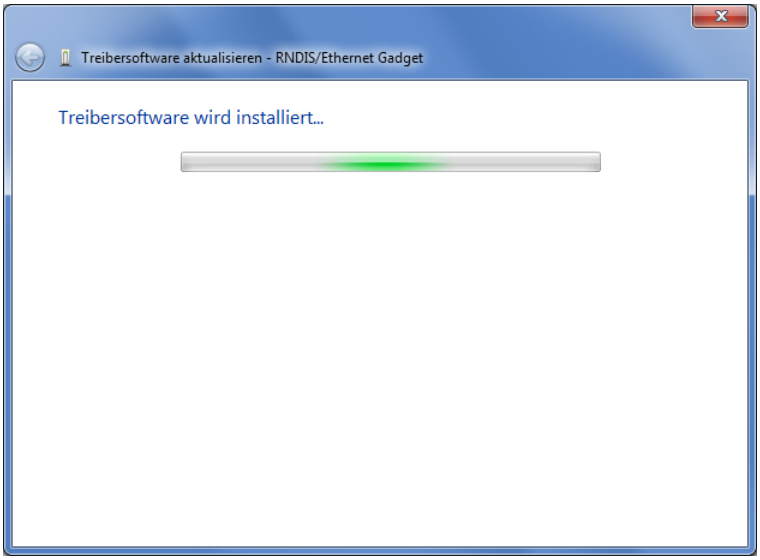


9. Click **Next** and confirm the warning with **Yes**.


Warnung: Update des Treibers
Es wird nicht empfohlen, diesen Gerätetreiber zu installieren, da nicht bestätigt werden kann, dass er mit den vorhandenen Hardwarekomponenten kompatibel ist. Wenn der Treiber inkompatibel ist, wird die Hardwarekomponente möglicherweise nicht einwandfrei funktionieren. Der Computer kann instabil werden oder wird nicht mehr funktionieren. Möchten Sie die Installation dieses Treibers fortsetzen?
Ja
Nein

10. The driver software installation finishes after a short waiting time.



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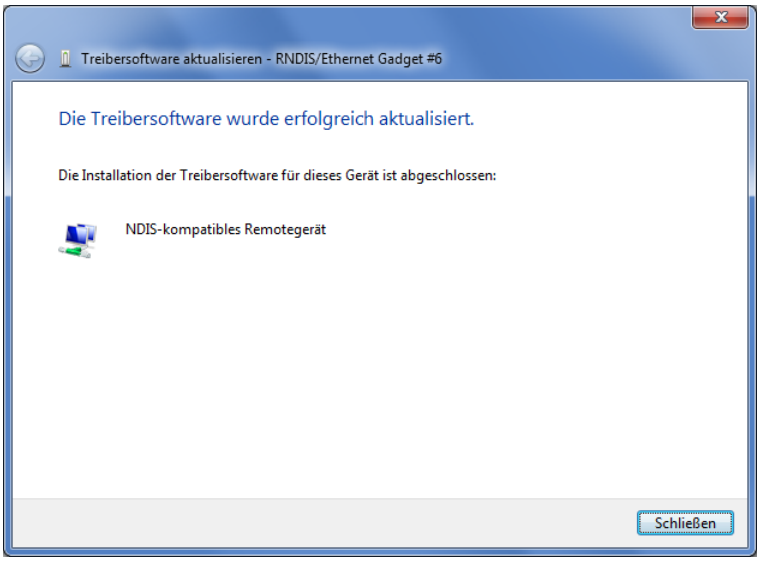
Treibersoftware aktualisieren - RNDIS/Ethernet Gadget #6
Die Treibersoftware wurde erfolgreich aktualisiert.
Die Installation der Treibersoftware für dieses Gerät ist abgeschlossen:
NDIS-kompatibles Remotegerät
Schließen

2.1.3. Factory settings

The *AnaGate CAN USB* is delivered with the following initial network settings:

IP address	`192.168.2.1`
Address type	static
Network mask	`255.255.255.0`
IP address PC	`192.168.2.2`

The device can now be configured using a standard browser (Internet Explorer, Firefox, etc.) by using `http://192.168.2.1`.

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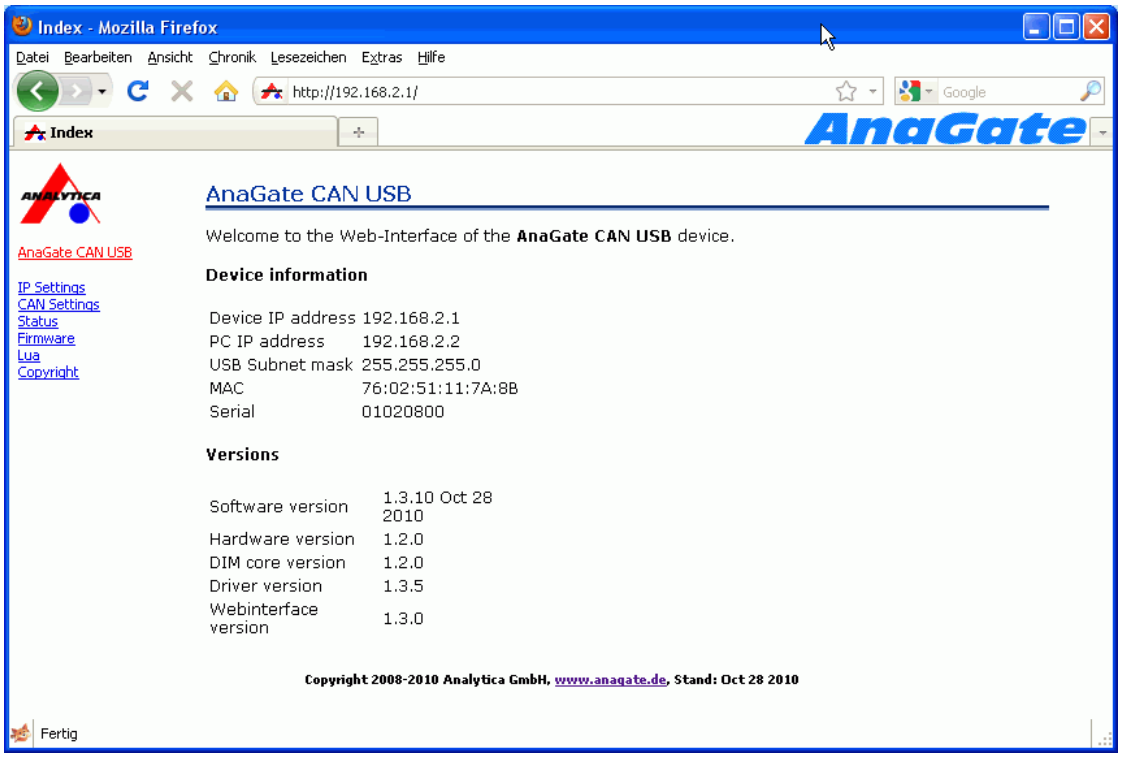

Figure 2.1. HTTP interface, AnaGate CAN USB

2.2. Network settings

On the page *IP Settings* the following settings can be changed.

Device IP address	The IP address of the *AnaGate CAN USB* is entered in dot format (e.g. `192.168.1.200`).
PC IP address	This IP address in dot format (e.g. `192.168.1.201`) is used by the PC. This IP address must be in the same subnet as the *AnaGate CAN USB* address.
USB Subnet mask	The subnet mask is entered in dot format (e.g. `255.255.255.0`).

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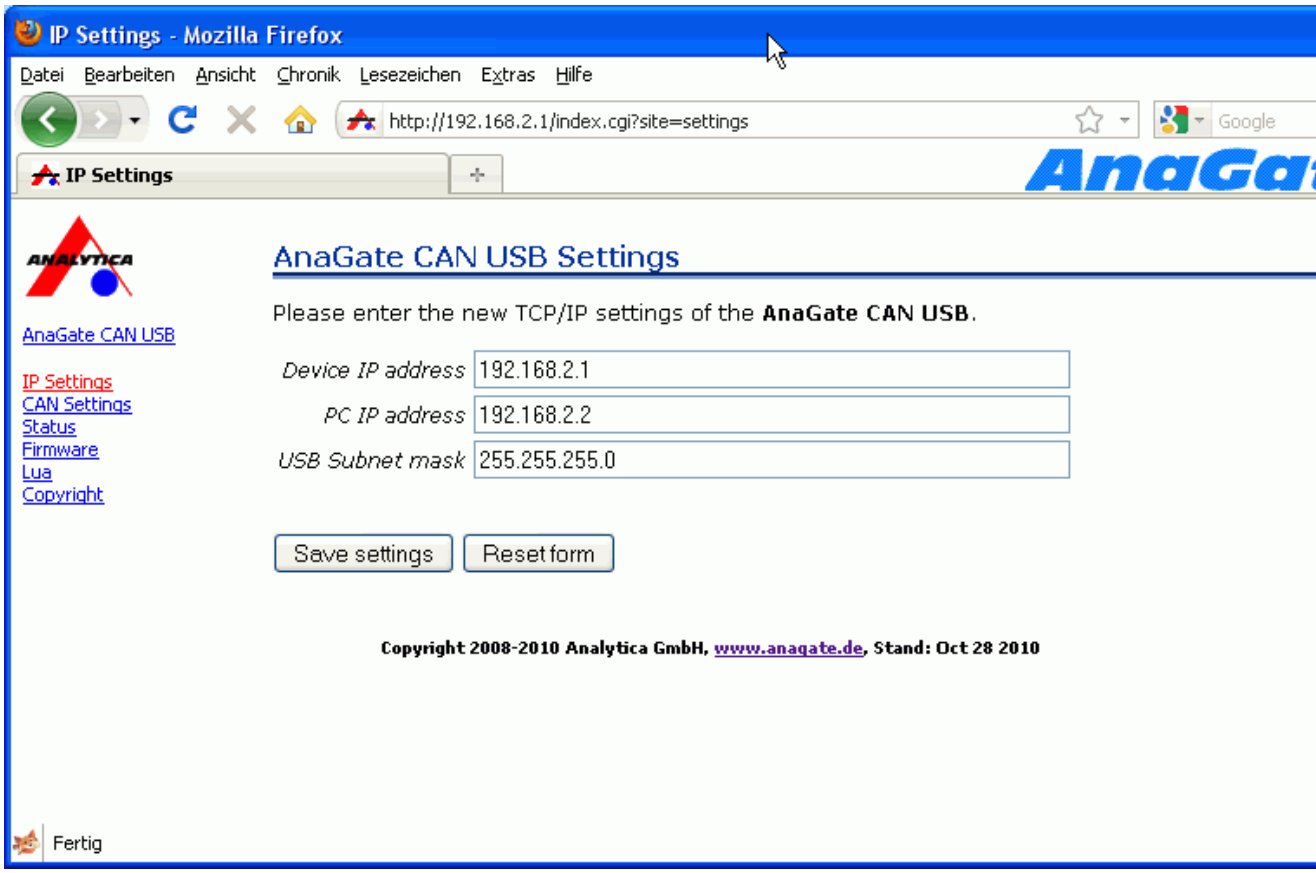

Figure 2.2. HTTP interface, network settings

The inputs will be taken over immediately after clicking the button **Save settings** and saved permanently on the *AnaGate CAN USB*. A restart of the device is not necessary for activation of the settings.

Note

Maybe the *ARP cache* of the PC has to be deleted to find the device with the changed IP address.

Note

After changing the PC IP address the operating system may use the old address for another up to 15 minutes before it switches to the new value. If the change must be used immediately then temporarily disconnect the *AnaGate CAN USB* from the PC to enforce an update of the used address.

2.3. CAN settings

On the page *CAN Settings* the global settings for the CAN interface are displayed and can be changed individually.

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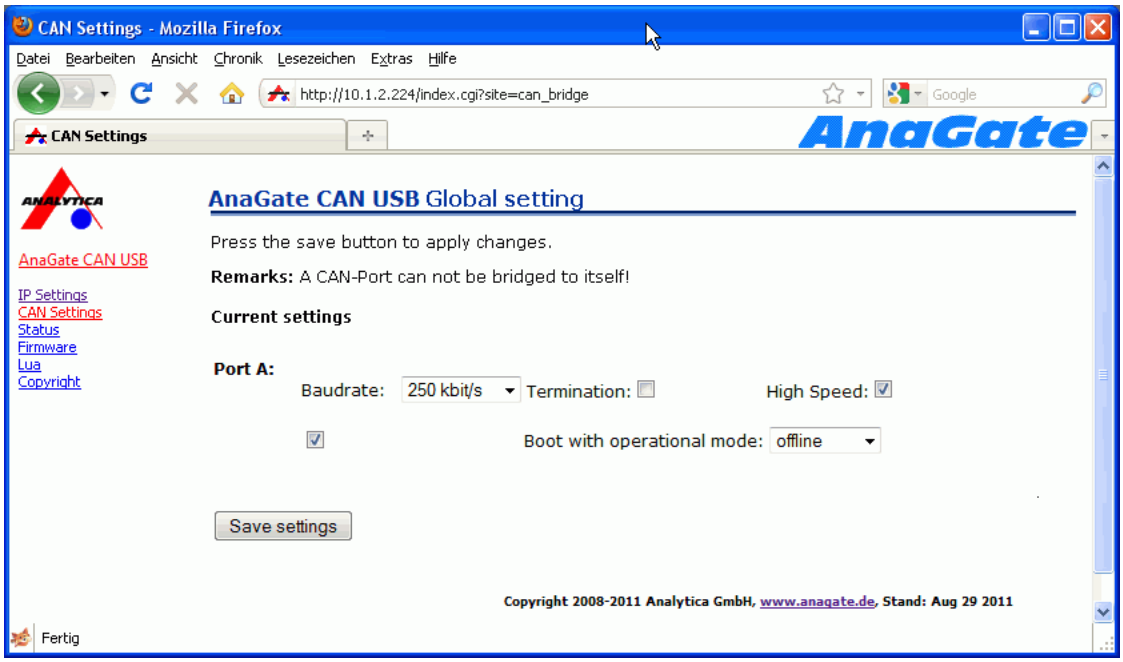

Figure 2.3. HTTP interface, CAN settings

Baudrate — The baud rate can be selected easily via a list box containing all supported values.

Termination — Use the check box to switch on/off the internal termination resistor.

High Speed — Activates/deactivates the *Highspeed mode*. In this operating mode all incoming/outgoing CAN telegrams are not longer confirmed by the opposite LAN side to accelerate process throughput. Software-Filters are switched off too in this mode.

Boot with operational mode — Initial operating mode of the CAN controller. Default value is **offline**.

- offline — The CAN controller is not active on the CAN bus (offline).
- normal — Normal operating mode. The default setting of CAN baud rate is used.
- listen — In listen mode the CAN controller is passive. CAN messages are received, but no messages can be sent (no ACK, no error). The default setting of CAN baud rate is used.
- loopback — In loopback mode every sent CAN message is mirrowed back by the CAN controller (no ACK, no errors). The default setting of CAN baud rate is used.

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A more detailed description of the operating modes can be found in the data sheet of the CAN controller (Microchip MCP2515).

The inputs will be taken over immediately after clicking the button **Save settings** and saved permanently on the *AnaGate CAN USB*. A restart of the device is not necessary for activation of the settings.

2.4. Advanced settings

On the page *CAN Settings* the advanced settings of the unit are displayed and can be changed individually.

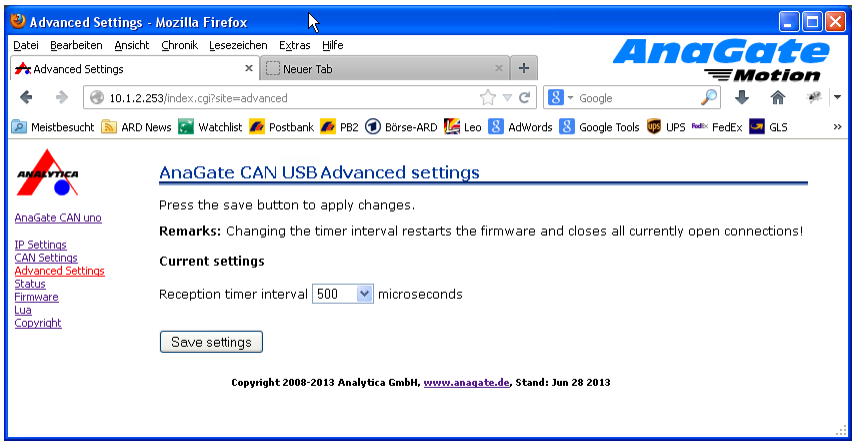

Figure 2.4. HTTP interface, CAN settings

Reception timer interval

This value specifies the frequency which is used to examine if new CAN telegrams are available in the internal driver buffer. The more frequently this examination is done, the shorter is the latency of the re-transmission of the CAN data via ethernet. On the other hand, its maximum message throughput is decreased.

The interval is defined in micro seconds, default value is `3000`. To give control immediately to the firmware after a CAN telegram is received by the CAN driver, the value `0` has to be set.

The inputs will be taken over immediately after clicking the button **Save settings** and saved permanently on the *AnaGate CAN USB*. A restart of the device is not necessary for activation of the settings.

2.5. Device status

On the page *Status* the device dependand status information is shown.

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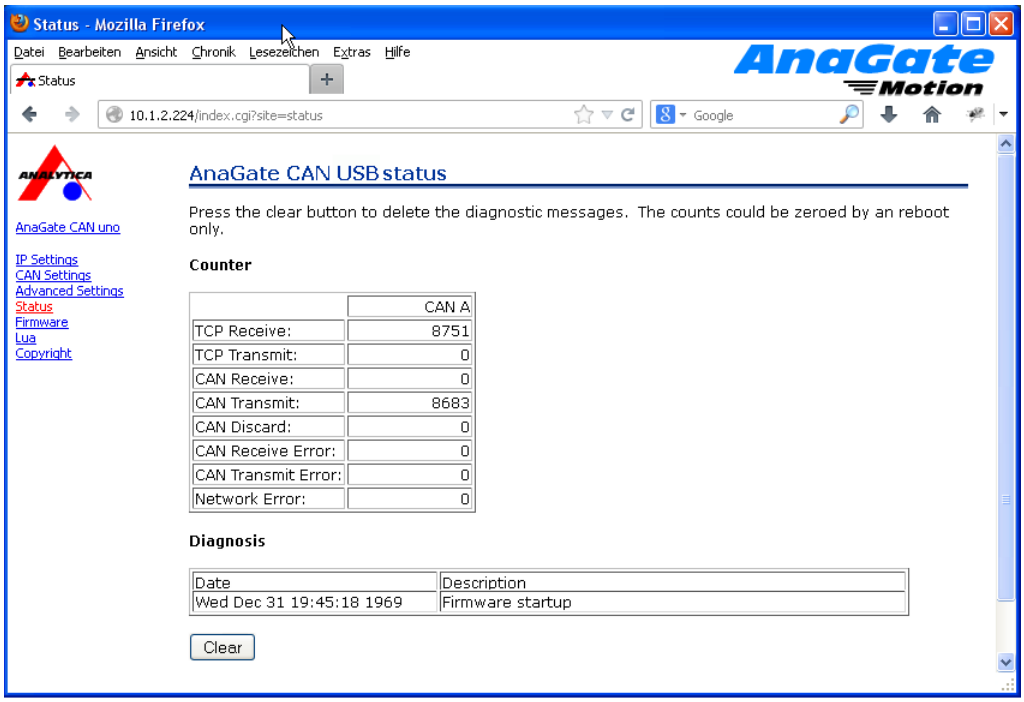

Figure 2.5. HTTP interface, Status

TCP Receive — Number of via TCP/UDP received CAN messages (CAN firmware)

TCP Transmit — Number of via TCP/UDP transmitted CAN messages (CAN firmware)

CAN Receive — Number of received CAN messages (CAN bus, CAN driver)

CAN Transmit — Number of transmitted CAN messages (CAN bus, CAN driver)

CAN Discard

- Timeout sending CAN telegram (1s)

  This indicates that no active partner is connected to the CAN bus (no ACK received). Also a wrong baud rate or missing termination can cause this error.

- A CAN telegram received from CAN bus is discared because the receive buffer is full (600 entries)

  This happens when the CAN firmware does not read telgrams fast enough out of the driver receive buffer. This may be the case even if CAN telegrams routed via TCP/UPD can not received fast enough by the connected ethernet client(PC,PLC) because of load problems (e.g. full receive TCP buffers).

- The firmware discards outgoing CAN telegrams because the send buffer is running full (1000 entries)

  This happens when CAN telegrams are not sent fast enough successfully to CAN bus. This may be a resultant problem

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	of timeouts during transmission or of overloading the CAN bus concerning the current used baud rate.
CAN Receive Error	Register *Rx-Err-Count* of the CAN-Transceiver
CAN Transmit Error	Register *Tx-Err-Count* of the CAN-Transceiver
Network Error	TCP/UPD transmit error (CAN firmware)

After clicking the button **Clear** all saved diagnosis entries are deleted on the device. To reset the system counters the device must be switched off.

2.6. Functional extensions based on Lua

On an *AnaGate CAN USB* it is possible to execute self-created applications with an installed Lua script interpreter (see [Prog-2013] for a detailed description of all programming features).

On the page *Lua* Lua script files can be uploaded to the device and executed locally.

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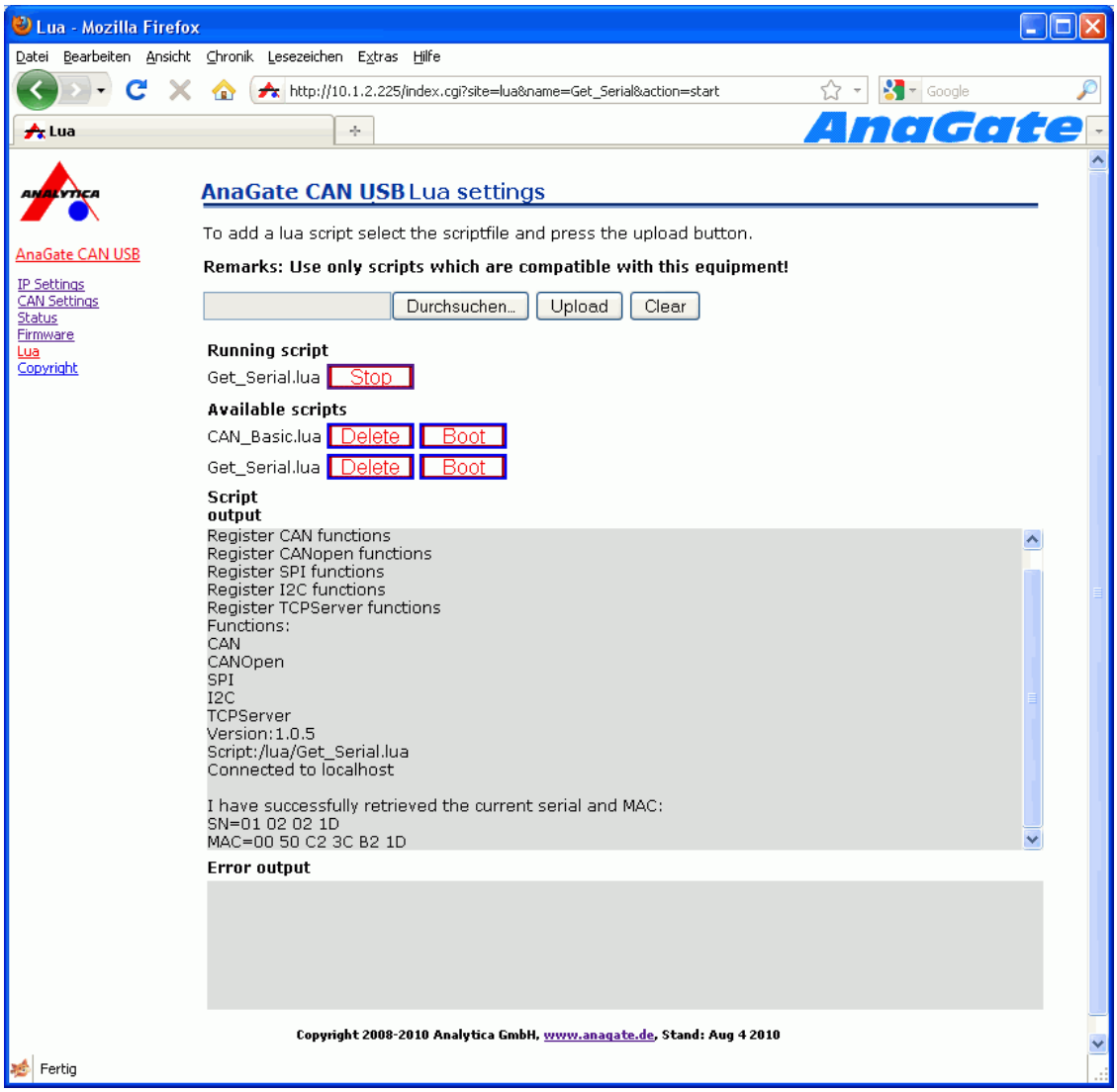

Figure 2.6. HTTP interface, Lua settings

Browse... Opens a file upload dialog to select a Lua script file.

Upload Uploads the selected script file to the device.

Clear Clears the current script file selection.

Boot script	Script file executed on system startup. Via the button **Delete** the boot script can be deactivated. Only one boot script is allowed.
Running script	Displays the currently executing script file. Via the button **Stop** the execution can be cancelled.
Available scripts	Displays all scripts which are currently available on the device.

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	To start the execution of a script click on the button **Start**. Via button **Delete** a script can be deleted on the device and via **Boot** a script can be defined as boot script.
script output area	In this text area the standard output (stdout) of the currently executing script is displayed. Via the button **Clear** this text area can be cleared.
error output area	In this text area the standard error output (stderr) of the currently executing script is displayed. Via the button **Clear** this text area can be cleared.

Tip

The text areas for script and error output are not refreshed automatically. A manual page reload of the current page refreshes both text areas.

2.7. Factory reset

In order to restore the default factory settings, hold the *RESET* for approx. 10 seconds. If the device is reset successfully, the yellow LED blinks until the *RESET* is released.

The default factory settings are activated immediately without a restart of the device:

IP address	`192.168.2.1`
Address type	static
Network mask	`255.255.255.0`
IP address PC	`192.168.2.2`

Important

If the *RESET* push-button is pressed too briefly, the actual IP address and network mask is pulsed via the yellow LED (Morse code). A second push of the *RESET* terminates the pulsing, the device is not reset.

Note

The factory reset is not possible directly after power on until complete loading of the operating system and the firmware of the device. This initialization period is signalled via the yellow busy LED. On power on the LED is switched on and after initialization the LED is switched off.

Note

Maybe the *ARP cache* of the PC has to be deleted to find the device with the changed IP address.

Note

After changing the PC IP address the operating system may use the old address for another up to 15 minutes before it switches to the new value.

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If the change must be used immediately then temporarily disconnect the *AnaGate CAN USB* from the PC to enforce an update of the used address.

2.7.1. Examining the network settings

It is possible to check the current network settings directly on the device.

After pressing shortly the *RESET* button the device starts to pulse out the current n settings via the yellow activity LED. Pressing again the buttons stops the pulsing immediately.

The IP address and subnet mask are pulsed out, one after the other. Following pulse codes are used:

- Digits 1, 2, 3, ..., 9: 1x, 2x, ...9x Flashing (200ms delay between each flash)
- Digit 0: 10x flashing (200ms delay between each flash)
- Dot: 1x very fast flash

Between two single digits a delay of 1 seconds is made, and between the IP address and subnet mask two fast flashes are pulsed out.

Figure 2.7. AnaGate CAN USB, Example blinking output

2.8. Firmware update

The device firmware of the *AnaGate CAN USB* is updated via the integrated web server of the device.

On the home page of the web server the current firmware information is displayed.

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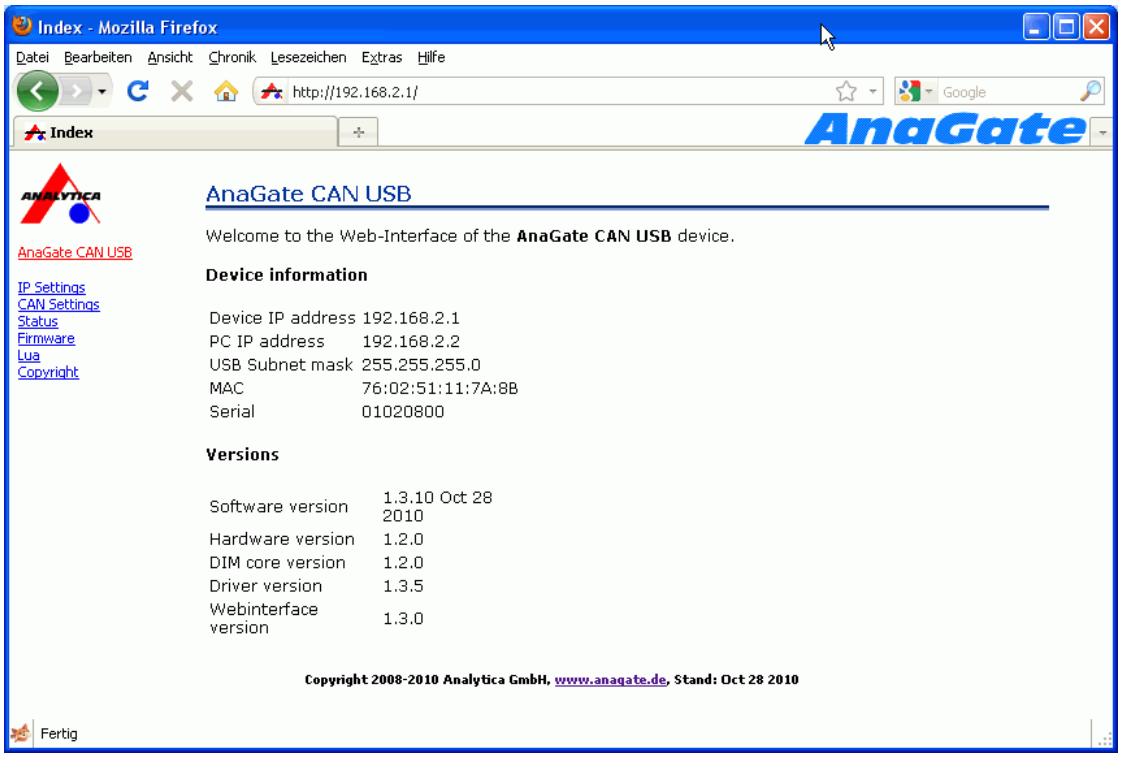

Figure 2.8. HTTP interface, AnaGate CAN USB

Proceed please as follows, in order to install the firmware on the *AnaGate CAN USB*:

- Click *Firmware* on the left navigation bar to navigate to the Firmware-Upload page.

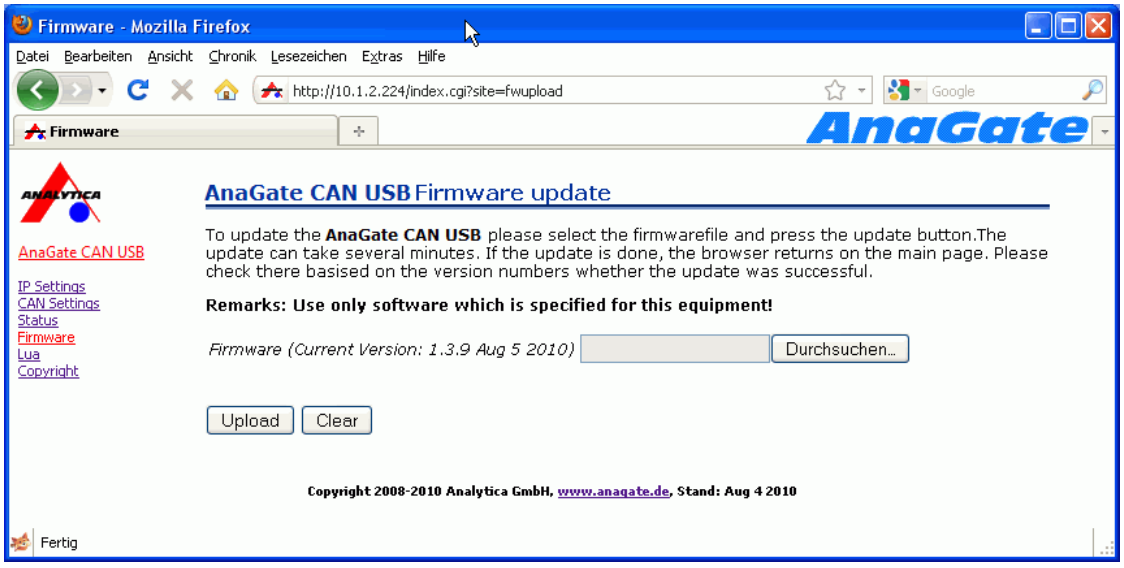
Firmware - Mozilla Firefox
Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe
http://10.1.2.224/index.cgi?site=fwupload
Firmware
AnaGate
AnaGate CAN USB
IP Settings
CAN Settings
Status
Firmware
Lua
Copyright
AnaGate CAN USB Firmware update
To update the AnaGate CAN USB please select the firmwarefile and press the update button.The update can take several minutes. If the update is done, the browser returns on the main page. Please check there basised on the version numbers whether the update was successful.
Remarks: Use only software which is specified for this equipment!
Firmware (Current Version: 1.3.9 Aug 5 2010)
Durchsuchen...
Upload
Clear
Copyright 2008-2010 Analytica GmbH, www.anagate.de, Stand: Aug 4 2010
Fertig

Figure 2.9. HTTP interface, firmware update

- Select the update package (file extension *.upd) via the **Browse** button.

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- Clicking on the button **Upload** loads the update file to the device and starts the update process.
- During the update process several installation messaged are displayed on the website. If the update is successfully finished, **Update done!** is displayed.

When the update is finished the browser navigates back to the home page. Check, if the new firmware version is display here.

Warning

If the firmware could not be flashed correctly on the device, the AnaGate may not longer ready for operation.

Please visit our web site `http://www.anagate.de` for further information.

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Chapter 3. Fields of application

If the *AnaGate CAN USB* is connected to the CAN bus, mind the following facts:

- **CAN_L**: This line has to be connected to the CAN_Low line of the CAN bus.
- **CAN_H**: This line has to be connected to the CAN_High line of the CAN bus.
- **GND**: This line can be connected optionally to GND of the other bus devices.

3.1. Gateway mode

In gateway mode the CAN messages are transferred transparently over TCP/IP between the CAN network and the PC in both directions. The *AnaGate CAN USB* uses no unique CAN ID when sending telegrams, this ID has to be set explicitly for each transmitted message.

All CAN messages received by the device are transmitted to all active application programs. It is possible to discard all incoming messages in general or to set individual software filters to reduce the message traffic to the applications.

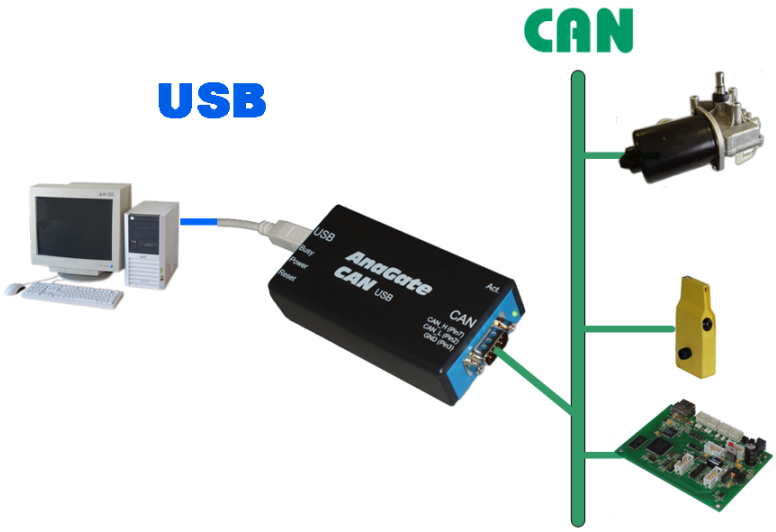

Figure 3.1. AnaGate CAN USB in gateway mode

The *AnaGate CAN USB* can be accessed via the following interfaces:

- The software program CAN Monitor, which is included on the documentation CD, can be used to monitor a CAN bus or to create single CAN telegrams.
- Application programs which are using the included software API inteface.
- Self-created batch files which are executed via the included Lua interpreter with integrated AnaGate software API.

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3.2. CANopen Conformance Test Tool

The *CANopen Conformance Test Tool (CCT)* is a software tool, which is created and supported by the *CAN in Automation (CiA)*. It is used by the CiA to certificate CANopen devices. The Windows tool needs a hardware device to get access to the CAN bus and a manufacturer-specific application library called `COTI.dll`.

All CAN ethernet gateways and the CAN USB gateway offered by *Analytica GmbH* can be used by the *CANopen Conformance Test Tool* of the CiA.

To use the *AnaGate CAN USB* with the *CCT* the AnaGate-COTI extension must be copied to the installation path of the *CCT*. The COTI extension files can be find on the AnaGate CD in the path `Tools\COTI`. In addition, the configuration file `Settings.ini` must be customized. The configuration file must also be placed in the installation path of the *CCT*, it can be edited by a standard text editor like *Notepad*.

The following entries are contained in the file `Settings.ini`:

```
[Interface0]
IP=192.168.2.1
Port=0
```

Example 3.1. Settings.ini

IP IP-Address of the used *AnaGate CAN Gateway*.

Default address is `192.168.1.254`, this is the standard network address of all models with Ethernet interface.

For devices of model type *AnaGate CAN USB* the entry *`IP=192.168.2.1`* has to be used.

Port Used CAN Port of the *AnaGate CAN Gateway*.

For devices of model type *AnaGate CAN USB* the entry *`Port=0`* has to be used.

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Appendix A. FAQ - Frequently asked questions

Here is a list of frequently asked questions.

A.1. Common questions

Q: No USB connection

A: Please check first the physical connection to the device. Basically the *AnaGate* has to be connected to a personal computer either directly or through a USB hub. To establish the connection a cable with a type A plug at one end and a type B plug at the other end needs to be used.

The physical interconnection is ok if the green power LED lights up while a USB cable is plugged in and is connected to a running PC. The green LED keeps being on until the connection breaks down.

If the power LED is always off then please check the wiring and the power supply via the PC.

Q: No network connection

A: If the power LED indicates a proper USB connection (see previous FAQ) but you still can't connect to the *AnaGate* then please try the following:

1. Check if the *AnaGate* can be reached via ping. To do so in Windows, open a command prompt and enter the command **ping a.b.c.d**", where `a.b.c.d` is the device IP address.

2. In case the *AnaGate* is unreachable via ping, reset the device to factory settings. Set up the PC network connection to the *AnaGate CAN USB* to obtain an IP address automatically. Check if the *AnaGate* can be reached via **ping 192.168.2.1**.

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3. If the device can be reached via ping then the next step is to try if you can open a TCP connection to port 5001. Open a Windows command prompt and enter **telnet a.b.c.d 5001**, where `a.b.c.d` is the device IP address. If this command fails, check if a firewall runs on your PC.

Q: Using a firewall

A: When working with a firewall, the a TCP port has to be opened for communication with the AnaGate device:

Device	Port number
AnaGate I2C	5000
AnaGate CAN	5001
AnaGate CAN USB	5001
AnaGate CAN uno	5001
AnaGate CAN duo	5001, 5101
AnaGate CAN quattro	5001, 5101, 5201, 5301
AnaGate SPI	5002
AnaGate Renesas	5008
AnaGate Universal Programmer	5000, 5002, 5008
AnaGate UP 2.0	5000, 5002, 5008
AnaGate CAN X1	5001
AnaGate CAN X2	5001, 5101
AnaGate CAN X4	5001, 5101, 5201, 5301
AnaGate CAN X8	5001, 5101, 5201, 5301, 5401, 5501, 5601, 5701

Table A.1. Using AnaGate hardware with firewall

A.2. Questions concerning AnaGate CAN

Q: What is the value of the termination resistor when the termination option of the device is activated?

A: The termination resistor of the *AnaGate* is driven by a FET transistor. The resistor itself has 110 Ohm while the internal resistance of the FET is 10 Ohm if the FET is activated. So the resulting resistance is 120 Ohm, as required by the CAN bus.

Q: Does Analytica offer a CAN gateway which does not have a galvanically isolated CAN interface?

A: Any device that is actively connected to a CAN bus should be galvanically isolated. Especially when using USB-operated devices (like the *AnaGate USB*) it is essential to have a galvanically isolated device because the device is power supplied by the PC.

Q: How to directly interconnect two CAN ports!

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A: If you want to interconnect two *AnaGate CAN* just via a direkt link CAN cable, you have to switch on the internal termination on both *AnaGate CAN* devices. A CAN bus network must have a termination on each side.

Note

it may work with lower baud rates without termination, but it is recommended to use a termination.

Q: Receiving a NAK when sending a CAN telegram.

A: If no CAN partner is connected to the *AnaGate CAN* (aka the CAN network), it is not possible to send CAN telegrams. The *AnaGate CAN* gets a NAK from the CAN controller. These NAK errors are sent to the AnaGate client via a data confirmation telegram.

Warning

If data confirmations are switched off no errors are sent to the client. The option *confirmations for data requests* can be set via the `CANSetGlobals` function. In High Speed Mode data confirmations are always disabled.

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Appendix B. Technical support

The AnaGate hardware series, software tools and all existing programming interfaces are developed and supported by Analytica GmbH. Technical support can be requested as follows:

Internet

The AnaGate web site [http://www.anagate.de/en/index.html] of Analytica GmbH contains information and software downloads for AnaGate Library users:

- Product updates featuring bug fixes or new features are available here free of charge.

E-Mail

If you require technical assistance over the Internet please send an e-mail to

<support@anagate.de>

To help us provide you with the best possible support please keep the following information and details at hand when you contact our support team.

- Version number of the used programming tool or AnaGate library
- AnaGate hardware series model and firmware version
- Name and version of the operating system you are using

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Abbreviations

I2C	Inter-Integrated Circuit
SCL	Serial Clock Line
SDA	Serial DAta Line
SPI	Serial Peripheral Interface
CLK	Clock
MISO	Master In Slave Out
SS	Slave Select
MOSI	Master Out Slave In
TRST	Test Reset
SRST	Slave Reset
JTAG	Joint Test Action Group
TDI	Test Data Input
TDO	Test Data Output
TMS	Test Mode Select Input
TCK	Test Clock
DHCP	Dynamic Host Configuration Protocol

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